

What is claimed is:

1. A digital communication system (20) having a symbol generator (21) and a modulator (22), the symbol generator (21) for translating a bit stream into a symbol stream based on a predetermined signal constellation (30), each symbol in the symbol stream representing a predetermined even number of consecutive bits in the bit stream, the modulator (22) using a predetermined modulation scheme to modulate a carrier signal with the symbol stream so as to provide a modulated carrier signal, characterized in that the signal constellation (30) has a dimensionality that is at least four and is an integral multiple of two, and that each symbol of the signal constellation (30) corresponds to an ordered set of at least two sets of two or more numbers, and further characterized in that for each of the at least four-dimensional symbols, the modulator (22) modulates the carrier signal using in turn each of the at least two corresponding sets of two or more numbers.

2. The digital communication system of claim 1 further characterized in that each symbol of the signal constellation is located in the signal constellation so as to be separated from any other symbol by at least a distance of $a^5 P^{1/2} / b$, where $a = 2^{1/4}$ and $b = (1 + 2^{1/2})^{1/2}$ and P is the power radiated in transmitting one symbol.

3. A method by which a digital communication system (20) transmits a bit stream, the digital communication system (20) having a symbol generator (21) and a modulator (22), the symbol generator (21) for translating the bit stream into a symbol stream based on a predetermined signal constellation (30), each symbol in the symbol stream representing a predetermined even number of consecutive bits in the bit stream, the modulator (22) using a predetermined modulation scheme to modulate a carrier

signal with the symbol stream so as to provide a modulated carrier signal, characterized in that the signal constellation (30) has a dimensionality that is at least four and is an integral multiple of two, and that each symbol of the signal constellation (30) corresponds to an ordered set of at least two sets of two or more numbers, and further characterized in that for each of the at least four-dimensional symbols, the modulator (22) modulates the carrier signal using in turn each of the at least two corresponding sets of two or more numbers.

4. The method of claim 3, further characterized in that each symbol of the signal constellation is located in the signal constellation so as to be separated from any other symbol by at least a distance of $a^5 P^{1/2} / b$, where $a = 2^{1/4}$ and $b = (1 + 2^{1/2})^{1/2}$ and P is the power radiated in transmitting one symbol.